

Section I

(Claims 1 -12 are cancelled)

13. (currently amended) The CVD precursor composition according to claim ~~12~~ 41, wherein the aminosilane source reagent compound is selected from the group consisting of: Si(NMe<sub>2</sub>)<sub>3</sub>Cl, Si(NEt<sub>2</sub>)<sub>2</sub>Cl<sub>2</sub>, Si(NMe<sub>2</sub>)<sub>4</sub>, and Si(NEt<sub>2</sub>)<sub>4</sub>.

14. (currently amended) The CVD precursor composition according to claim ~~12~~ 41, wherein the metalloamide source reagent compound and the aminosilane source reagent compound are injected by liquid delivery into a chemical vapor deposition chamber.

15. (currently amended) The CVD precursor composition according to claim ~~12~~ 41, wherein the metalloamide source reagent compound and the aminosilane source reagent compound are delivered by bubbler into a chemical vapor deposition chamber.

16 (cancelled)

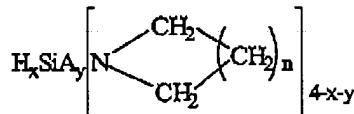
17. (currently amended) The CVD precursor composition according to claim ~~12~~ 41, wherein the precursor composition further comprises a solvent medium selected from the group consisting of: ethers, glymes, tetraglymes, amines, polyamines, alcohols, glycols, aliphatic hydrocarbon solvents, aromatic hydrocarbon solvents, cyclic ethers and combinations of two or more of the foregoing.

18. (currently amended) The CVD precursor composition according to claim ~~12~~ 41, wherein the metalloamide source reagent ~~compounds are co-injected~~ compound is injected by liquid delivery into a chemical vapor deposition chamber.

19. (cancelled)

20. (currently amended) A CVD precursor composition for forming a thin film dielectric on a substrate, such precursor composition including at least one aminosilane source reagent compound selected from the group consisting of:

$H_xSiA_y(NR^1R^2)_{4-x-y}$ ; and



wherein H is hydrogen; x is from 0 to 3; Si is silicon; A is a halogen; Y is from 0 1 to 3; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, and C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl; and n is from 1-6.

21. (currently amended) A CVD precursor composition for forming a thin film dielectric on a substrate, such precursor composition including at least one aminosilane source reagent compound ~~The CVD precursor according to claim 20, wherein the aminosilane source reagent is selected from the group consisting of Si(NMe<sub>2</sub>)<sub>3</sub>Cl, Si(NEt<sub>2</sub>)<sub>2</sub>Cl<sub>2</sub>, Si(NMe<sub>2</sub>)<sub>4</sub>, and Si(NEt<sub>2</sub>)<sub>4</sub>.~~

22. (original) The CVD precursor composition according to claim 20, wherein R<sup>1</sup> and R<sup>2</sup> of the aminosilane are methyl.

23. (original) The CVD precursor composition according to claim 20, wherein R<sup>1</sup> and R<sup>2</sup> are ethyl.

24. (currently amended) A CVD precursor composition for forming a thin film dielectric on a substrate, such precursor composition including at least one aminosilane source reagent compound having the formula:

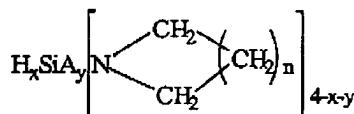
$H_xSiA_y(NR^1R^2)_{4-x-y}$

wherein H is hydrogen; x is from 0 to 3; Si is silicon; A is halogen; Y is from 0 to 3; N is nitrogen; R<sup>1</sup> is methyl, R<sup>2</sup> is ethyl; and n is from 1-6. The CVD precursor composition according to claim 20, wherein R<sup>1</sup> is methyl and R<sup>2</sup> is ethyl.

25. (currently amended) The CVD precursor composition according to claim 24 ~~20~~, wherein the aminosilane source reagent compound is ~~selected from the group consisting of:~~  $\text{Si}(\text{NEt}_2)_2\text{Cl}_2$ ,  $\text{Si}(\text{NMe}_2)_3\text{Cl}$ ,  $\text{Si}(\text{NMe}_2)_4$ ,  $\text{Si}(\text{NEt}_2)_4$ , and  $\text{Si}(\text{NMeEt})_4$ .

26. (currently amended) A CVD precursor composition for forming a thin film dielectric on a substrate, such precursor composition including at least one aminosilane source reagent compound selected from the group consisting of:

$\text{H}_x\text{SiA}_y(\text{NR}^1\text{R}^2)_{4-x-y}$ ; and



wherein H is hydrogen; x is from 0 to 3; Si is silicon; A is a halogen; Y is from 0 to 3; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, and C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl; and n is from 1-6 and The CVD precursor composition according to claim 20, wherein the precursor composition further comprises a solvent medium selected from the group consisting of: ethers, glymes, tetraglymes, amines, polyamines, alcohols, glycols, aliphatic hydrocarbon solvents, aromatic hydrocarbon solvents, cyclic ethers and combinations of two or more of the foregoing.

27. (original) The CVD precursor composition according to claim 26, wherein the solvent is octane.

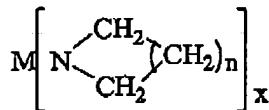
28. (cancelled)

29. (currently amended) The CVD precursor composition according to claim 26 ~~20~~, wherein the aminosilane source reagent compound is injected by liquid delivery into a chemical vapor deposition chamber.

30. (cancelled)

31. (currently amended) The CVD precursor of claim 26-29, wherein the precursor composition further comprises a metalloamide source reagent compound selected from the group consisting of:

$M(NR^1R^2)_x$ ; and



wherein M is selected from the group consisting of: Zr, Hf, Y, La, Lanthanide series elements, Ta, Ti, Al; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl, alkylsilyl; and x is the oxidation state on metal M; and n is from 1-6; and

32. (original) The CVD precursor composition according to claim 31, wherein R<sup>1</sup> and R<sup>2</sup> of the metalloamide source reagent are methyl.

33. (original) The CVD precursor composition according to claim 31, wherein R<sup>1</sup> and R<sup>2</sup> of the metalloamide source reagent compound are ethyl.

34. (original) The CVD precursor composition according to claim 31, wherein R<sup>1</sup> of the metalloamide source reagent compound is methyl and R<sup>2</sup> of the metalloamide source reagent compound is ethyl.

35. (original) The CVD precursor composition according to claim 31, wherein M is Zr.

36. (original) The CVD precursor composition according to claim 31, wherein M is Hf.

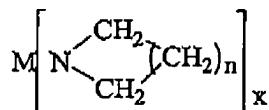
37. (original) The CVD precursor composition according to claim 31, wherein the metalloamide source reagent compound is selected from the group consisting of: Zr(NMe<sub>2</sub>)<sub>4</sub>, Zr(NMeEt)<sub>4</sub>, Zr(NEt<sub>2</sub>)<sub>4</sub>, Ta(NEt<sub>2</sub>)<sub>5</sub>, Ta(NMe<sub>2</sub>)<sub>5</sub>, Ta(NMeEt)<sub>5</sub>, Zr(NiPr<sub>2</sub>)<sub>4</sub>, Zr(NMe<sub>2</sub>)<sub>2</sub>(NPr<sub>2</sub>)<sub>2</sub>, Zr(NC<sub>6</sub>H<sub>12</sub>)<sub>4</sub>, Zr(NEt<sub>2</sub>)<sub>2</sub>(NPr<sub>2</sub>)<sub>2</sub>, Hf(NEt<sub>2</sub>)<sub>4</sub>, Hf(NMe<sub>2</sub>)<sub>4</sub>, Hf(NMeEt)<sub>4</sub>, La(NMe<sub>2</sub>)<sub>3</sub>, La(NEt<sub>2</sub>)<sub>3</sub>, La(NMeEt)<sub>3</sub>, Al(NMe<sub>2</sub>)<sub>3</sub>, Al(NEt<sub>2</sub>)<sub>3</sub>, Y(NMe<sub>2</sub>)<sub>3</sub>, Y(NEt<sub>2</sub>)<sub>3</sub>, Y(NMeEt)<sub>3</sub>, Ti(NMe<sub>2</sub>)<sub>4</sub>, Ti(NEt<sub>2</sub>)<sub>4</sub>, Ti(NMeEt)<sub>4</sub>, Ta(NMe<sub>2</sub>)<sub>5</sub>, Ta(NEt<sub>2</sub>)<sub>5</sub>.

38. (original) The CVD precursor composition according to claim 31, wherein the metalloamide source reagent compound is selected from the group consisting of  $Zr(NMe_2)_4$ ,  $Zr(NEt_2)_4$ ,  $Zr(NMeEt)_4$ ,  $Hf(NEt_2)_4$ ,  $Hf(NMe_2)_4$  and  $Hf(NMeEt)_4$ .

Claims 39 and 40 cancelled.

41. (original) A CVD precursor composition for forming a thin film dielectric on a substrate, such precursor composition including a vapor source reagent mixture including a metalloamide source reagent compound selected from the group consisting of:

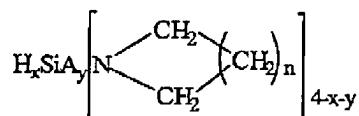
$M(NR^1R^2)_x$ ; and



wherein M is selected from the group consisting of: Zr, Hf, Y, La, Lanthanide series elements, Ta, Ti, Al; N is nitrogen; each of  $R^1$  and  $R^2$  is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl,  $C_1$ - $C_8$  alkyl,  $C_1$ - $C_8$  perfluoroalkyl, alkylsilyl; and x is the oxidation state on metal M; and n is from 1-6; and

an aminosilane source reagent compound selected from the group consisting of:

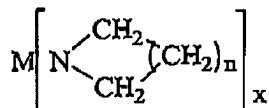
$H_xSiA_y(NR^1R^2)_{4-x-y}$ ; and



wherein H is hydrogen; x is from 0 to 3; Si is silicon; A is a halogen; Y is from 0 to 3; N is nitrogen; each of  $R^1$  and  $R^2$  is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl,  $C_1$ - $C_8$  alkyl, and  $C_1$ - $C_8$  perfluoroalkyl; and n is from 1-6; x is from 0 to 3; Si is silicon; A is a halogen; Y is from 0 to 3; N is nitrogen; n is from 1-6.

42. (currently amended) A CVD multi-component, single source reagent composition useful for forming a silicate thin film dielectric on a substrate, the source reagent composition comprising at least one metalloamide vapor source reagent compound selected from the group consisting of:

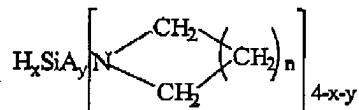
$M(NR^1R^2)_x$ ; and



wherein M is selected from the group consisting of: Zr, Hf, Y, La, Lanthanide series elements, Ta, Ti, Al; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl, alkylsilyl; and x is the oxidation state on metal M; and n is from 1-6; and

an aminosilane vapor source reagent compound selected from the group consisting of:

$H_xSiA_y(NR^1R^2)_{4-x-y}$ ; and



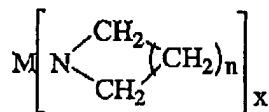
wherein H is hydrogen; x is from 0 to 3; Si is silicon; A is a halogen; Y is from 0 to 3; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, and C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl; and n is from 1-6; and

a solvent medium in which the metalloamide compound and the aminosilane compound are soluble or suspendable.

43. (cancelled)

44. (currently amended) The method according to claim 43 59, wherein the metalloamide source reagent compound precursor is selected from the group consisting of:

$M(NR^1R^2)_x$ ; and



wherein M is selected from the group consisting of: Zr, Hf, Y, La, Lanthanide series elements, Ta, Ti, Al; N is nitrogen; each of R<sup>1</sup> and R<sup>2</sup> is same or different and is independently selected from the group consisting of H, aryl, perfluoroaryl, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> perfluoroalkyl, alkylsilyl; and x is the oxidation state on metal M; and n is from 1-6.

45. (currently amended) The CVD method according to claim 43 59, wherein the source reagent composition is vaporized in a liquid delivery apparatus.

46. (currently amended) The CVD method according to claim 43 59, wherein the source reagent vapor is transported into the chemical vapor deposition chamber in a pulsed deposition mode.

47. (currently amended) The CVD method according to claim 43 59, wherein the dielectric thin film is deposited in the absence of an oxidizer.

48. (currently amended) The CVD method according to claim 43 59, wherein the source reagent vapor further comprises a co-reactive gas.

49. (original) The CVD method according to claim 48, wherein the co-reactive gas is selected from the group consisting of ozone, water vapor and reactive alcohols.

50. (currently amended) The CVD method according to claim 43 59, wherein the metalloamide source reagent compound is selected from the group consisting of: Zr(NMe<sub>2</sub>)<sub>4</sub>, Zr(NEt<sub>2</sub>)<sub>4</sub>, Zr(NMeEt)<sub>4</sub>, Hf(NMe<sub>2</sub>)<sub>4</sub>, Hf(NEt<sub>2</sub>)<sub>4</sub> and Hf(NMeEt)<sub>4</sub>

51. (currently amended) The CVD method according to claim 42 59, wherein the metalloamide source reagent compound is Hf(NMe<sub>2</sub>)<sub>4</sub>.

52. (currently amended) A CVD method of forming a dielectric thin film on a substrate, comprising the steps of:

vaporizing a source reagent composition comprising at least one metalloamide precursor dissolved or suspended in octane, to form a source reagent precursor vapor;

transporting the source reagent precursor vapor into a chemical vapor deposition zone, optionally using a carrier gas;

contacting the source reagent precursor vapor with a substrate in the chemical vapor deposition zone at elevated temperature, to deposit a dielectric thin film on the substrate. The CVD method according to claim 50, wherein the metalloamide source reagent compound is dissolved or suspended in octane.

53. (currently amended) The CVD method according to claim 43 59, wherein the metalloamide source reagent compound is solubilized or suspended in a solvent.

54. (cancelled)

55. (currently amended) The CVD method according to claim 43 59, wherein the metalloamide source reagent compound is  $Zr(NMe_2)_4$ .

56. (currently amended) A CVD method of forming a dielectric thin film on a substrate, comprising the steps of:

vaporizing a source reagent composition comprising  $La(NMe_2)_3$  and  $Zr(NMe_2)_4$  to form a source reagent precursor vapor;

transporting the source reagent precursor vapor into a chemical vapor deposition zone, optionally using a carrier gas;

contacting the source reagent precursor vapor with a substrate in the chemical vapor deposition zone at elevated temperature to deposit a dielectric thin film on the

substrate. The CVD method according to claim 55, wherein the metalloamide precursor further comprises  $\text{La}(\text{NMe}_2)_3$ .

57. (currently amended) A CVD method of forming a dielectric thin film on a substrate, comprising the steps of:

vaporizing a source reagent composition comprising  $\text{Y}(\text{NMe}_2)_3$ , to form a source reagent precursor vapor;

transporting the source reagent precursor vapor into a chemical vapor deposition zone, optionally using a carrier gas;

contacting the source reagent precursor vapor with a substrate in said chemical vapor deposition zone at elevated temperature to deposit a dielectric thin film on the substrate. The CVD method according to claim 43, wherein the metalloamide source reagent compound is,  $\text{Y}(\text{NMe}_2)_3$ ,

58. (currently amended) A CVD method of forming a dielectric thin film on a substrate, comprising the steps of:

vaporizing a source reagent composition comprising  $\text{Hf}(\text{N}(\text{CH}_3)_2)_4$  and  $\text{La}(\text{N}(\text{CH}_3)_2)_3$ , to form a source reagent precursor vapor;

transporting the source reagent precursor vapor into a chemical vapor deposition zone, optionally using a carrier gas;

contacting the source reagent precursor vapor with a substrate in the chemical vapor deposition zone at elevated temperature to deposit a dielectric thin film on the substrate. The CVD method according to claim 43, wherein the metalloamide source reagent compound comprises  $\text{Hf}(\text{N}(\text{CH}_3)_2)_4$  and  $\text{La}(\text{N}(\text{CH}_3)_2)_3$ ,

59. (currently amended) A CVD method of forming a dielectric thin film on a substrate, comprising the steps of:

vaporizing a source reagent composition comprising at least one metalloamide source reagent compound and at least one aminosilane source reagent compound, to form a source reagent precursor vapor;

transporting the source reagent precursor vapor into a chemical vapor deposition zone, optionally using a carrier gas;

contacting the source reagent precursor vapor with a substrate in said chemical vapor deposition zone at elevated temperature to deposit a dielectric thin film on the substrate. The CVD method according to claim 43, further comprising an aminosilane precursor.

60. (currently amended) The CVD method according to claim 57 59, wherein the metalloamide source reagent compound is  $\text{Hf}(\text{NMe}_2)_4$  and the aminosilane source reagent compound is  $\text{Si}(\text{NMe}_2)_3\text{Cl}$ .

61. (currently amended) The CVD method according to claim 43 59, wherein the carrier gas is selected from the group consisting of: He, Ar,  $\text{H}_2$ ,  $\text{N}_2$  and  $\text{O}_2$ .

62. (currently amended) The CVD method according to claim 43 59, further comprising an oxidizing gas selected from the group consisting of:  $\text{O}_2$ ,  $\text{N}_2\text{O}$ , NO and  $\text{O}_3$ .

63. (original) The CVD method according to claim 62, wherein the oxidizing gas is  $\text{N}_2\text{O}$ .

64. (currently amended) The CVD method according to claim 43 59, further comprising an oxidizing gas, wherein the oxidizing gas is  $\text{N}_2\text{O}$ .

65. (currently amended) The CVD method according to claim 43 59, wherein the metalloamide source reagent compound is vaporized at a temperature in the a range of from about 100°C to about 300°C.

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66. (currently amended) The CVD method according to claim 43 59, wherein the temperature in the chemical vapor deposition zone is ~~at a temperature in the range of from between~~ about 350°C to about 750°C.